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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR   | ATTORNEY DOCKET NO.        | CONFIRMATION NO. |
|---|-------------|------------------------|----------------------------|------------------|
| 10/604,220  | 07/01/2003  | Thomas Bradley Beddard | 839-1470                   | 1219             |
| 30024   | 7590        | 05/31/2006             |                            |                  |
| NIXON & VANDERHYE P.C.<br>901 NORTH GLEBE ROAD, 11TH FLOOR<br>ARLINGTON, VA 22203 |             |                        | EXAMINER<br>KERNS, KEVIN P |                  |
|   |             |                        | ART UNIT                   | PAPER NUMBER     |
|   |             |                        | 1725                       |                  |
| DATE MAILED: 05/31/2006   |             |                        |                            |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

### Application No.

10/604,220

### Applicant(s)

BEDDARD ET AL.

### Examiner

Kevin P. Kerns

### Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,7 and 9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7 and 9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The amendment filed May 17, 2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "said pair of pegs lying substantially in a (common) plane containing said coplanar legs" and "perpendicular to the elongated open slot". Although Figures 2-4 of this application appear similar to these limitations, the applicants are referred to MPEP 2125 that states, "Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale". Furthermore, the applicants have not set forth the criticality of these new matter limitations in the originally filed specification. Applicants are required to cancel the new matter in the reply to this Office Action.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 2, 6, 7, and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regard to independent claims 1 and 7, the new limitations "said pair of pegs lying substantially in a (common) plane containing said coplanar legs" and "perpendicular to the elongated open slot" lack support in the originally filed specification, and is considered to be new matter. Although Figures 2-4 of this application appear similar to these limitations, the applicants are referred to MPEP 2125 that states, "Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale". Furthermore, the applicants have not set forth the criticality of these new matter limitations in the originally filed specification. Why are these additional limitations pertaining to the core dimensions critical?

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 2, 6, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Obrochta et al. (US 4,283,835) in view of the applicants' admitted prior art (paragraph [0002] of applicants' specification), and further in view of either Willett et al. (EP 1 022 434 A2) or Lee (US 6,234,753).

Obrochta et al. disclose a cambered core positioning system for use in casting of gas turbine airfoils, in which the cambered ceramic core 20 includes a solid curved upper body portion; a pair of substantially planar legs extending downwardly from the upper body portion, with the upper body portion being curved to form opposite concave 26' and convex 26 surfaces, and the pair of legs being separated by an elongated slot 37; and a plurality (arranged in pairs) of laterally aligned pegs, a pair (28,30) of which lie in a common plane (fixed pins 28,30,32 cooperating with respective spring-loaded movable peripheral pins 28',30',32', as well as cooperating movable centerline pins 34,34',36,36') projecting axially from opposite sides of the convex surface 26 of the upper body portion above and closer to the elongated slot 37, but spaced from an upper edge of the upper body portion (abstract; column 2, lines 55-68; column 3, lines 1-26; column 4, line 9 through column 7, line 54; and Figures 1-3). Obrochta et al. do not disclose that the pair of legs is co-planar, the pegs of elliptical cross section, and a core

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having an elongated open slot extending from a lower end of the core upwardly more than half a height dimension of the core.

However, the applicants' admitted prior art discloses a stage 1 gas turbine bucket that includes a (co-planar) "pants-leg" shaped core operable to form a pair of cooling passages to improve the cooling scheme of the turbine bucket (see paragraph [0002] of applicants' specification).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the design of the pair of legs and arrangement of pegs of the cambered core used for casting gas turbine airfoils, as disclosed by Obrochta et al., by using a co-planar "pants-leg" shaped core, as taught by the applicants' admitted prior art, which would result in the arrangement of pegs of Obrochta et al. being substantially perpendicular to the co-planar "pants-leg" shaped core (and the elongated slot formed therebetween) of the applicants' admitted prior art, in order to form a pair of cooling passages to improve the cooling scheme of the turbine bucket (paragraph [0002] of applicants' specification).

Neither Obrochta et al. nor the applicants' admitted prior art specifically discloses pegs of elliptical cross section, as well as a core having an elongated open slot extending from a lower end of the core upwardly more than half a height dimension of the core.

However, Willett et al. disclose a gas turbine blade cooling configuration for gas turbine buckets, in which the cooling configuration is provided by one or more elliptically-shaped radial cooling passages 54 formed by utilizing elliptically-shaped



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quartz rods (pegs) within the ceramic core, such that the use of elliptically-shaped quartz rods (pegs) provides the advantages of creating coolant cross flow between adjacent radial passages while minimizing stress concentration in the bucket (abstract; paragraphs [0005]-[0010]; and Figures 1-3). Furthermore, Figure 1 shows a gas turbine blade cooling configuration having an array of cooling circuit dividing channels that must be manufactured by one or more cores having an elongated open slot extending from a lower end of the core upwardly more than half a height dimension of the core, such that such a core creates longer divided cooling channels that would result in improved cooling of the turbine blade, as one of ordinary skill in the art would have recognized.

In addition, Lee discloses a turbine airfoil with internal cooling, in which the internal cooling is provided by a plurality of core tie holes (42,142) that are preferably elliptical in cross-section, such that the core tie holes (42,142) would necessarily be created by using core supports in the form of elliptical pegs/rods, with the elliptical core tie holes providing the advantages of controlling coolant cross flow between adjacent radial passages (via minimizing pressure differential) while minimizing stress in the turbine airfoil (abstract; column 2, lines 10-17 and 40-67; column 3, line 1 through column 5, line 53; and Figures 1 and 2). Furthermore, Figures 1 and 2 show a turbine airfoil having an array of cooling circuit dividing channels that must be manufactured by one or more cores having an elongated open slot extending from a lower end of the core upwardly more than half a height dimension of the core, such that such a core creates longer divided cooling channels that would result in improved cooling of the turbine airfoil, as one of ordinary skill in the art would have recognized.

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the cambered ceramic core disclosed by Obrochta et al., by using a co-planar "pants-leg" shaped core and arrangement of pegs, as taught by the applicants' admitted prior art, which would result in the arrangement of pegs of Obrochta et al. being substantially perpendicular to the co-planar "pants-leg" shaped core (and the elongated slot formed therebetween) of the applicants' admitted prior art, in order to form a pair of cooling passages to improve the cooling scheme of the turbine bucket, and by further using pegs/pins with elliptical shapes, and a core having an elongated open slot extending from a lower end of the core upwardly more than half a height dimension of the core, as taught/suggested individually by Willett et al. and Lee, in order to create coolant cross flow between adjacent radial passages while minimizing stress concentration in the bucket (Willett et al.; paragraphs [0005] and [0010]), and in order to control coolant cross flow between adjacent radial passages (via minimizing pressure differential) while minimizing stress in the turbine airfoil (Lee; column 3, lines 29-31 and 62-67; column 4, lines 1-5 and 25-67; and column 5, lines 1-53). Furthermore, both Willett et al. and Lee disclose and/or suggest that the array of cooling circuit dividing channels made by one or more cores, as one of ordinary skill in the art would have recognized, are advantageous for creating longer divided cooling channels that would result in improved cooling of the turbine blade and airfoil, respectively.



***Response to Arguments***

7. The examiner acknowledges the applicants' amendment received by the USPTO on May 17, 2006. The applicants' amendments raise a new specification objections and 35 USC 112, 1<sup>st</sup> paragraph (new matter) rejections (see sections 1-3). Claims 1, 2, 6, 7, and 9 remain under consideration in the application.

8. Applicants' arguments filed May 17, 2006 have been fully considered but they are not persuasive.

With regard to the applicants' remarks/arguments on pages 5-7 of the amendment, the examiner respectfully disagrees with the applicants' arguments and has provided newly underlined portions in above section 6 to address a portion of the arguments. First, the addition of the amended limitations that are rejected under 35 USC 112, 1<sup>st</sup> paragraph (new matter rejections) do not alter the prior grounds of rejection, but the newly underlined portions of section 6 address these "new matter" limitations. Second, the examiner respectfully disagrees with the applicants' characterization of "pants-leg" shaped core in the middle of page 5 of the remarks, as a "pants-leg" is necessarily a feature that includes co-planar legs, and no lack of acknowledgement or admission would obscure this factual physical property of a "pants-leg". Third, in response to applicants' argument in the middle of page 6 that states "the core (being) made coplanar would effectively destroy the core for its intended purpose and in fact prevent formation of the desired blade shape", the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the

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structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin P. Kerns *Kevin Kerns 5/26/06*  
Primary Examiner  
Art Unit 1725

*KPK*  
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May 26, 2006